Some subsequent editing

The Role of Case Institute of Technology

Mr. Crawford, Trustees and friends of Case. There are just two matters I would like to discuss with you tonight. One is a public accounting of the last ten busy years at Case. This is certainly your due, for without the generous cooperation of the people in this audience -- and many who were unable to be with us tonight -- the progress of the past ten years would have been impossible. I hope you will share the feeling of pride that animates the faculty, students and trustees of Case as they look back over the past ten years. The second topic is an assessment of the problems confronting American higher education, not only in Case's specialized fields of engineering, science and management, but in the broader sense of the importance of higher education to our nation as a whole.

As we look back over the past, our progress in one single field of activity is visible to every citizen of Cleveland. The last decade has seen the beginning of a major building program that has resulted in the construction of nine new buildings on our campus requiring the investment of more than ten million dollars. Well over ninety per cent of this sum was provided by private donors; individuals and corporations, alumni, trustees and friends.

Our chemists and chemical engineers, our electrical engineers, our astronomers and our specialists in the new field of electronic computing machines are housed in new buildings with really modern laboratory facilities. We have built an aeronautical and jet propulsion center with a unique flexibility

for instruction and research. We now have two fine dormitories in Yost and Pardee Halls and a Student Union in Tomlinson Hall. The new Sam W. Emerson Physical Education Center standing majestically at the head of Carnegie Avenue and the rebuilt Van Horn Field have given our students athletic facilities second to none in our part of the country.

While the increase in building is an obvious and visual gage of progress, the real excellence of an educational institution depends upon its faculty, its student body, and the educational and research programs they mutually pursue. Modern facilities are essential, but it is the quality of the teachers, investigators and students that determine the status of the institution. Here too, we may chart progress.

Through a conscious effort to improve the quality of our faculty, and by raising faculty salaries to the point where we could more adequately meet the competition, both within the academic world and, to an extent, from industry, we have definitely increased faculty standards. The proportion of our faculty holding Doctor's degrees has increased by fifty per cent; the proportion holding only Bachelor's degrees has declined by the same amount. This improvement in quality has been accompanied by an increase in numbers, from a full-time teaching faculty of 132 to 203 in ten years.

The activity of this faculty in research can be seen in our current list of publications, numbering more than 200 scientific papers, articles and books in a period of two years, and in a research budget that at its current

rate of a million and a half dollars a year is three times what it was a decade ago.

All of these improvements in the quality and scholarly output of our faculty and in the excellence of our physical facilities have combined to help change Case from a predominantly local institution to one which this year has drawn its students from 32 of the United States and 22 foreign countries. In this process we believe we see a measurable improvement in the quality of our entering students. Of the 502 freshmen admitted this fall, the largest freshman class outside the veteran inflated postwar years, eighty per cent were in the upper quarter of their high school classes.

Importantly, too, the number of graduate students enrolling for full or part-time study has increased in this same ten years from 209 to 750 - more than 350%. Annually we are awarding 75 or more Master's degrees and 15 or more doctorates. In this rapidly moving and increasingly complex, technologically based society and economy of ours, these highly trained men of specialized talent are destined to play an increasingly important role in the future. Much more expensive to provide than undergraduate programs, graduate level education is, nevertheless, a most important element in our total educational system and particularly in the professional fields which we serve.

Proud as I am of having played a small part in the achievement of this record of ten years of effort and progress, I stand before you tonight, humbly grateful that you and others like you have combined into one great

force of individuals and organizations of individuals to provide the support and wise counsel without which our efforts would have been less fruitful. To you, to the members of our Board of Trustees, to our increasingly active and distinguished faculty and to the members of our supporting administrative and service staff must go the credit for these accomplishments. Only in America can this sort of community effort be repeated over and over again in support of worthwhile causes. Only in Cleveland can we find the vital spirit and sense of community cooperation that makes our tasks as administrators most meaningful and rewarding. For the benefits we are now able better to provide for our young men, we are grateful to you.

But now let's look ahead. Where are we going?

The effort of the past decade was necessary to begin the task of giving Cleveland what it deserved, one of the finest centers of engineering education, management training, and scientific research in the United States. We had to aim high, for we now live in an era in which to be second best is to fail -- to be content with less than maximum accomplishment is to fall hopelessly behind. When the Soviet earth satellite streaked across Cleveland skies in October -- observed incidently by our newly opened Nassau Observatory -- it brought home to each of us in dramatic fashion our complete dependence upon technological manpower. Without a reservoir of specialized talent capable of creating and using the tools and technology of today's increasingly

complicated world, our industry, commerce and our very society itself are in danger. Without a continuing stream of able young men flowing into plant reservoir, democracy as we know it may vanish from the scene, buried beneath the determination of those who serve - not man, but the state.

Permit me to recall a few of these technological developments which call upon all the knowledge and skill we possess if we are to use them wisely. In the ten years since I came to Case, we have been forced to alter our thinking to consider, not only earth satellites -- our own and other nations' -- but automation, the H bomb along with the possibility of harnessing the fusion process in this incomparably deadly weapon to produce useful energy, transistors, television, new metals, new plastics and other synthetic materials, and the electronic computers which are being used to help control the processes of our industries and to assist in solving some of the most baffling managerial problems of the day.

Impressive as the list may seem, I am sure that the coming decades will produce even more revolutionary changes that will place even greater demands upon our all too small supply of specialized talent. These changes will require ever more skilled engineers and scientists. We dare not lose this race to develop these engineers and scientists as we lost in the attempt to put an earth satellite in the sky. And while it may be that we cannot compete with Russia on the basis of sheer numbers of graduates from our technical schools and universities, I am confident that we can, if we will,

more than outdistance them in quality. Indeed I am convinced that a mere numbers race will result in a greater probability of failure to maintain the position of technological leadership of which we have been so inordinately proud than would be the case if we concerned ourselves as much with quality as we inevitably will with quantity.

At Case we like to believe that we have already made such a start in improving the quality of engineering, scientific and management education. Permit me to emphasize that we have made only a start. We are a long way from completing the job that we have no choice but to attempt to do. And we were able to make this start because you and other far-sighted citizens of Cleveland responded to our appeals, not only within the past ten years, but throughout the history of our institution. Whenever we have been able to show you what we were trying to do, how we were trying to do it, we could count upon your response.

Engineering education as it has existed on our campus and elsewhere has been subjected to a rigorous re-examination by the Case faculty. There was a time when engineering schools were content to turn out men trained in the tools of yesterday to work in the world of tomorrow. Now, time moves too fast, obsolescence in educational methods like obsolescence in factory machinery is a luxury we no longer dare afford.

One major key to education of the modern engineer, scientist and manager, is the development of a broad approach, covering the common core of knowledge essential to all specialized fields without sacrificing too much of the advantages of the specialized education within a given field. To reach their highest usefulness engineers must understand the society in which they live and all the factors that impinge upon it. For this reason, several years ago, we at Case launched a program of increased emphasis on the humanities and social sciences throughout our four year undergraduate course. Unique in concept, both as to material and method of presentation, we can now say that we are providing for our students a truly liberal education for leadership in our technologically based society. Our pioneering efforts in this field have attracted nationwide attention as other institutions have undertaken similar studies.

In a second effort to broaden the scope of education, we are concentrating upon educating students in the fields of knowledge basic to the many different kinds of engineering. In recent years, as science itself has pushed ahead into new fields, engineering has taken over areas formerly the exclusive province of science. And in turn, engineering has left behind areas once exclusively its province, but which now can be handled by adequately trained technicians. More and more, modern engineers must be trained to think in terms of systems, must be prepared to cut across formal engineering disciplines to solve the newer problems that in themselves demand the skills

of many of the specialized disciplines for their solution. In the accomplishment of this purpose, we will turn out engineers who are better able to handle the more traditional tasks of our basic industries, as well.

The third major change in engineering education is the increasing emphasis on self-reliance in the student. Our faculty is deeply involved in studies of methods which will accomplish this purpose. Unless we require of our students real mind-stretching intellectual effort we will be guilty of wasting a portion of their great potential for effective service to society. This -- we do not intend to do.

All these broad changes have taken place within the goals established by Alfred North Whitehead when he wrote that the main theme of his book, The Aims of Education could be stated in the following words: "The students are alive, and the purpose of education is to stimulate and guide their self-development. It follows as a corollary that the teachers should be alive with living thoughts." Thus research on the scientific level is not only essential for national survival and progress, it is an integral part of the educational process itself. The teachers who do research are the ones most certain to maintain this essential quality of "liveness." An institution such as Case should aim at being a community of scholars in which the faculty and students alike should pool their talents and energy in the common cause

of extending the frontiers of knowledge. Moreover, this quality of being alive that Whitehead stresses does not stop short with the awarding of a Bachelor's degree. An institution of higher learning in America has failed in its task if its graduates believe that a diploma is a ticket which allows them to pass out of the educational process forever. Education is a life-long challenge to the individual.

So far I have discussed the role of Case in terms of producing specialized talent in the fields of engineering and science. Equally important is the problem of developing the future managers who can harness the products of technology to the goals of American industry. One such approach is shown in the newly developed field of operations research, where Case has established the outstanding educational and academically-based research program in the country. Of equal importance is the reaching out of an institution into the industrial community to bring men already moving up in management the latest developments from research in fields as diverse as electronics and economics, as nuclear science and psychology.

All of these broad problems that confront every engineering school in the country, that place new pressures on every institution of higher learning, have one common denominator -- money. It requires

investment in buildings, in expensive equipment, in faculty salaries, and in research to produce the skilled graduates and scientific results that our national welfare demands. These costs have mounted. In 1939 the University of Chicago possessed one of the most distinguished physics departments in the nation, a department that became the nucleus of a team that created the first atomic pile. Its total research budget for physics in 1939 was less than $25,000 just about the sum that today is required to support one major research worker in an industrial laboratory. As Case has expanded its programs during the past decade, its annual budget for education and research has increased from a little less than two million dollars to over five and one-third million dollars.

To accomplish the tasks we have set ourselves in the future will require further increases in our expenditures. To accomplish the tasks we have set ourselves -- let me back up and restate that phrase so that it reads -- to accomplish the tasks you have set for us will require increases in our expenditures. Fundamentally, we do not set ourselves these tasks. In the main, we undertake their solution in response to demonstrated needs of industry, of the community and the nation. If we, you and I, did not have so many children and if our determination as a people to provide educational opportunities for all to the extent that they can

profit therefrom were not so strongly imbedded, we could rock along and sort of keep up with the times with a minimum expenditure of effort and money. Bluntly stated, your choice and mine is a simple one. We either contribute voluntarily to the support of higher education - or we will be taxed at increasingly higher levels to support it - or we will keep our children at home. We compound the problem by insisting that we must be working on tomorrow's problems today. Some of the men who entered Case in 1957 will be the same men who must be the leaders of this nation in the year 2000. And I doubt that the world will be any less complicated then than it is now. How, then, can we do otherwise than work at the cutting edge of each of the major fields of knowledge with which we deal?

Privately supported institutions such as Case find that obtaining essential financial support for their activities requires increasing amounts of time and energy. We have no easy source of funds. Unable and unwilling to draw upon the taxing power of the government, we prefer to turn to the generosity of our friends who understand and appreciate the magnitude of the task that confronts us. You may ask - why not retreat from this position of independence? Ladies and gentlemen, the privately supported institutions have possessed one great advantage in the history of American education. Free from governmental supervision,

they could experiment and pioneer in new fields and new educational techniques. They could serve as a model for other institutions, establish the standards of quality, provide the leadership that moved the educational stream into new channels. Historically, Harvard, JohnsHopkins and Columbia have played such a role among universities. We believe it to be our responsibility to maintain such a pioneering status among the engineering institutions.

But to do this requires money, academic risk capital, if you will, to invest in the new programs, the new techniques and above all, in the capable teachers who will instill that spark of inspiration, that encouragement to study, the determination to excel and the love of learning in our sons and daughters on the campuses of the nation. This is the challenge of our times. If we do not move forward, accepting these responsibilities, we will have only ourselves to blame when we fall short, as a people, of the demands made upon us by a world that is in desperate need of enlightened leadership and of the helping hand that our technological genius should be able to extend.

I have spoken briefly of our progress at Case, of the need of the nation for trained manpower to utilize the recent developments of technology and to produce the even greater developments that are needed for tomorrow.

I have indicated the problems we face, the solutions we seek. Now I would like to turn to a topic of unique concern to this audience.

Case is a part of Cleveland, the capital of the industrial heartland of America. Throughout its history there has been a close working relationship between Case and its community, especially the industry of northeastern Ohio. This relationship has been one of outstanding benefit to both. For every single student that enters Case from Cleveland these days, two of our graduates remain here to pursue their careers. The scientists and engineers on our faculty have contributed of their knowledge and skill when called upon. Ours has been no ivory tower existence, but rather throughout the entire development of our educational programs, we have sought to establish a busy two-way traffic between the campus and the market place of commerce and industry.

And this is as it should be, for Cleveland has a constellation of institutions that give it a unique place in American life today, a constellation of which Case is proud to be a part. Our museums and orchestra were founded by the men and women who helped build the greatness of Cleveland, who foresaw the needs of the present and the future in the past in which they lived. They followed the wise advice of Chicago architect Daniel Burnham when he said, "Make no little plans."

Within this constellation of institutions, we believe that Case has its own special role to fulfill. If we were asked to sum up our contributions to Cleveland in a single word, that word would be "people" -- trained, specialized people in management, engineering, and science, capable of accepting the responsibility for leadership in this community and in the nation. It was a Case scientist, Albert A. Michelson who first measured the speed of light, some seventy years ago, and laid part of the groundwork for the Einstein theory of relativity which has revolutionized modern physics and unleashed the power of the atom. It was at Case that basic discoveries were made in the science of sound, that a young chemist laid the foundations of one of the great chemical corporations in the United States, that other men too numerous to mention gained the inspiration and ability to create for themselves and the community many, many sound industrial enterprises. As we look back at the record of the past, we are most proud of the people we have produced.

The future of Case and the future of Cleveland are knit together by the firmest of bonds. For this reason, we joined with more than thirty other institutions in the University Circle project, taking our share of a twenty year $175 million commitment to the future of Cleveland. This realistic plan will result in the greatest educational, scientific, and cultural center ever projected. It is a clear cut vote of confidence in

the future of Cleveland. The projects that you will hear discussed for the immediate future of Case are an integral part of this overall plan. What I have told you of the accomplishments of the past ten years is only important as it leads to the work that we have left to do. The challenge is there; it is your challenge to us; and it is no little one. Your belief in us in the past has brought us to our present level of quality and service. Your belief in us and your generous support in the future will assure the attainment of those goals which will keep Case a bright and shining light on the horizon of educational excellence in this nation.